UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/392,124	09/08/1999	DOUGLAS A. CHRISSAN	8X8S.239PA	9597

7590   04/07/2004

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EXAMINER
AZAD, ABUL K

ART UNIT	PAPER NUMBER
2654	19

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/392,124	CHRISSAN ET AL.
	Examiner	Art Unit
	ABUL K. AZAD	2654

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2004*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This action is in response to the communication filed on January 14, 2004.

2.   Claims 1-32 are pending in this action.

3.   In view of the applicant's arguments the drawing objection set forth in the

previous office action (Paper No. 17) has been withdrawn.

4.   The applicant's arguments with respect to claims 1-32 have been fully

considered but they are not deemed to be persuasive. For examiner's response to the

applicant's arguments or comments, see the detailed discussion in the Response to the

Arguments section.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claims 1-27 and 29-32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Bialik (US 5,568,588) in view of Adoul et al. (US 5,754,976).

As per claim 1, Bialik teaches, "in a speech processing system including a signal

processor arrangement that analyzes an input speech signal and, in response,

generates the short-term characteristics of the input speech signal and a target vector, a

method of analyzing the input speech signal comprising:"

"generating from the target vector and the short term characteristics, a plurality of variable-amplitude pulses" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24 receives the gain range produced by gain range determiner22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for which sequence of equal amplitude pulses to obtained", form this statement it is clear that for each gain level the system will obtained a different amplitude of pulses; also teaches at col. 5, line 55 to col. 6, lines 27); and

"outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion GC_j for each gain level j", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can

be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines

7-18).

As per claim 2, Bialik teaches, "wherein the target vector is matched using a

perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a

criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 3, Bialik teaches, "a speech processing system including a signal

processor arrangement that analyzes an input speech signal and, in response,

generates the short-term characteristics of the input speech signal and a target vector,

comprising:"

"means for generating from the target vector and the short term characteristics, a

plurality of variable-amplitude pulses" (Fig. 1, element 10 a short term prediction

analyzer, element 13 target vector generator, element 20 pulse location determiner and

element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly

reads on, "typically has a value of 3 separate gain levels . . . the gain level selector 24

receives the gain range produced by gain range determiner22 and move through the

gain values within the gain range. It output, on output line 32, is current gain level for

each sequence of equal amplitude pulses to obtained", form this statement it is clear

that for each gain level the system will obtained a different amplitude of pulses; also

teaches at col. 5, line 55 to col. 6, lines 27); and

"means for outputting a signal corresponding to a sequence of equal-amplitude

pulses which, according to an error criterion, represents the target vector" (col. 6, lines

38-42, particularly reads on in step 76, target vector matcher 28 determines the value of

global criterion GC_j for each gain level j", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 4, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 5, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"an analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of variable-amplitude pulses" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector generator, element 20 pulse location determiner and element 38 pulse sequence which matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of 3 separate gain levels .

. . the gain level selector 24 receives the gain range produced by gain range determiner22 and move through the gain values within the gain range. It output, on output line 32, is current gain level for each sequence of equal amplitude pulses to obtained", form this statement it is clear that for each gain level the system will obtained a different amplitude of pulses; also teaches at col. 5, line 55 to col. 6, lines 27);

"the analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines the value of global criterion GC_j for each gain level j", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 6, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 7, Bialik teaches, "a speech processing system including a signal

processor arrangement that analyzes an input speech signal and, in response,

generates the short-term characteristics of the input speech signal and a target vector,

comprising:"

"a multi-pulse analyzer adapted to receive the target vector and the short term

characteristics and to generate a plurality of variable-amplitude, variable-sign and

variably-spaced pulses, each of said pulses having variable amplitudes and variable

signs" (Fig. 1, element 10 a short term prediction analyzer, element 13 target vector

generator, element 20 pulse location determiner and element 38 pulse sequence which

matches target vector; col. 4, lines 12-51, particularly reads on, "typically has a value of

3 separate gain levels . . . the gain level selector 24 receives the gain range produced

by gain range determiner22 and move through the gain values within the gain range. It

output, on output line 32, is current gain level for each sequence of equal amplitude

pulses to obtained", form this statement it is clear that for each gain level the system will

obtained a different amplitude of pulses, so for out put of multiple gain levels of pulses

will obtain a sequence of variable-amplitude; also teaches at col. 5, line 55 to col. 6,

lines 27; also Bialik teaches, "the pulse sequence is series of positive and negative

pulse sequence having the current gain");

"the multi-pulse analyzer being further adapted to output a signal corresponding

to a sequence of equal-amplitude, variable-sign, variably-spaced pulses which,

according to a maximum likelihood criterion, most closely represents the target vector"

(col. 6, lines 38-42, particularly reads on in step 76, target vector matcher 28 determines

the value of global criterion GC_j for each gain level j", where previously teaches at col. 4, lines 12-42, that each gain level produces equal-amplitude pulses and variable-sign and variably-spaced pulses).

Bialik does not explicitly teach, sequences of variable-amplitude pulses and each of the sequence having a different average amplitude value. However, Adoul teaches, "generating from the target vector and the short term characteristics, a sequences of variable-amplitude pulses, each of the sequence having a different average amplitude value" (see encoding principle). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Adoul's teaching in the invention of Bialik because Adoul teaches a very good performance can be achieved with variable-amplitude pulses without paying a heavy price (col. 10, lines 7-18).

As per claim 8, Bialik teaches, " wherein the target vector is matched using a perceptual weighting criterion" (col. 6, line 42-44, particularly reads on "for such a criterion, target vector matched 28 includes a perceptual weighting filter").

As per claim 9, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (Fig. 5, elements 10, 12, and col. 5, lines 1-15, impulse response is a function of short-term characteristics a_l provided along line 17 from analyzer 10").

As per claims 10-27, they are interpreted, thus rejected for the same reasons set forth in the rejection of claims 1-9.

As per claim 29, Bialik teaches, "wherein the pulse-train sequence modification function is based on a linear function" (col. 4, line 55 to col. 5, line 65, equation 2 is a linear function).

As per claim 30, Bialik teaches, "wherein the pulse-train sequence modification function is based on the short-term characteristics of the input speech signal" (col. 4, lines 55-65, short-term characteristic).

As per claim 31, Bialik teaches, "wherein the pulse-train sequence modification is based on the long-term characteristics of the input speech signal" (col. 3, lines 41-48, long-term analyzer).

As per claim 32, Bialik teaches, "wherein the pulse-train sequence modification function is based on the excitation signal from previous frames" (col. 6, lines 11-18, reads on "in step 62, determiner 25 updates the local criterion with the previous pulse as follows equation 7").

7.   Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bialik et al. (US 5,568,588) in view of Adoul et al. (US 5,754,976) as applied to claim 25 above, and further in view of Sklar (Digital Communications Fundamentals and Application).

As per claim 28, Bialik in view of Adoul do not explicitly teach modifying the pulse train based on the exponential function. However, Sklar teaches, in the speech signal processing to use pulse trains constructed based on the exponential function (Page 63, equations 2.10 and 2.11). It would have been obvious to one of ordinary skill in the art at the time of the invention to use pulse-train sequence modification function is based

on the exponential function because output speech quality is greatly increased, and

perceptually smooth.

Response to Arguments

8.   The applicant argues: "moreover, the '976 reference fails to correspond to the

asserted ones of Applicant's claim limitations. As discussed above, the instant invention

involves a plurality of sequences, where each sequence has variable-amplitude pulses.

In direct contrast, the '976 reference teaches that there are N non-zero-amplitude

pulses in a sequence and each has an amplitude equal to the amplitude pre-assigned to

the position p of the non-zero-amplitude pulse. *See* column 14, lines 19-26. Thus, each

of the pulses has equal amplitudes, and not the variable amplitudes as set forth in

Applicant's claims".

        The examiner respectfully disagrees with the applicant's assertion because pre-

assigned pulses amplitudes are not equal amplitude. The applicant has misinterpreted

the teaching of Adoul's Patent, Adoul teaches at col. 12, lines 24-33, "the purpose of the

amplitude selector 112 is to pre-establish a function S_p between the positions p of the

codevector waveform and the q possible values of the pulse amplitudes. The pre-

established function S_p is derived in relation to speech signal prior to codebook search.

More specifically, pre-establishing this function consists of pre-assigning, in relation to

the speech signal, at least one of the q possible amplitudes to each position p of the

waveform". From the above statement it is clear that the pre-established function S_p is

derived in relation to speech signal prior to codebook search, it does not mean that

each pulses has equal amplitudes, however, it says that each position has q possible

amplitudes.

9.   In response to applicant's argument that there is no suggestion to combine the

references, the examiner recognizes that obviousness can only be established by

combining or modifying the teachings of the prior art to produce the claimed invention

where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in

the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re

Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, suggestion to

combine the references is taken from the knowledge generally available to one of

ordinary skill in the art.

Conclusion

10.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Contact Information

11.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-

3838.**

          If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Richemond Dorvil**, can be reached at **(703) 305-9645.**

Any response to this action should be mailed to:

> **Commissioner for Patents**
>
> **P.O. Box 1450**
>
> **Alexandria, VA 22313-1450**

Or faxed to:

> **(703) 872-9314**
>
> (For informal or draft communications, please label "PROPOSED" or "DRAFT")
>
> Hand-delivered responses should be brought to 2121 Crystal Drive, Arlington,
>
> VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should

be directed to the Technology Center's Customer Service Office at telephone number

(703) 306-0377.

Abul K. Azad

April 2, 2004

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER